REMARKS

I. ALLOWABLE SUBJECT MATTER

The Office Action issued April 14, 2009 indicated that claims 85 and 86 presented in the amendment filed on April 1, 2009 contained allowable subject matter. The reasons that these claims are allowable over the US Patent of Anderson (US '574) are presented in paragraph 7 on page 5 of the Office Action.

Claim 85 has now been amended so that it is an independent claim that includes the limitations of independent claim 38, the sole claim on which it previously depended.

Accordingly allowance of the amended independent claim 85 is respectfully solicited.

New claim 87 has been added. New claim 87 includes the combined subject matter of dependent claim 86 and independent claim 49 and all the limitations of claims 49 and 86. Claim 86 has been canceled.

Accordingly favorable allowance of claim 87 is respectfully solicited.

The new claim 87 and the amended claim 85 should be allowed over the US Patent of Anderson because no glass composition claimed by these claims contains at least 80 wt. % of SiO_2 as required by Anderson for their application. Furthermore Anderson is not interested in making glass compositions that are X-

ray opaque, but is only interested in making glass beads for optical devices, such as retro-reflective products and fillers (column 1, lines 10 to 15; abstract of US '574; column 9, lines 32 to 39).

II. AMENDED CLAIM 84

In addition to the allowable subject matter noted in the Office Action it is respectfully submitted that the amended independent claim 84 above should also be allowed.

The amended independent claim 84 also limits the SiO_2 content to a maximum amount of 88.1 mol %.

The amended independent claim 84 contains the limitations from the previously pending dependent claim 84 and from independent claim 42 as well as the further limitation that the claimed composition is free of fluorine.

In other words, the amended independent claim 84 covers the embodiments of the independent claim 42 in which $F_2 = 0$ (free of fluorine) and the maximum permissible amount of SiO_2 is 88.1 mol %. The upper limit for SiO_2 is the SiO_2 concentration taken from numerous exemplary compositions in Table I on pages 23 and 24 of applicants' originally filed specification.

Thus the amended independent claim 84 is fully supported by the disclosures in the originally filed application in accordance with the policy for amending claims for compositions with concentration ranges of ingredients from M.P.E.P. 2163.05 and the *In re Wertheim* judicial decision.

The amended independent claim 84 also includes allowable subject matter because if ZrO_2 amounts in the claimed glass composition are replaced by amounts of any of the other metal oxide ingredients (WO_3, La_2O_3, La_2O_3...) recited in the amended claim 84 besides Yb_2O_3 the amount of SiO_2 in the claimed glass composition cannot be 80 wt. % or greater. The reason that the amounts of SiO_2 will never be at least 80 wt % in the claimed glass composition is that the molecular weight of each of the other metal oxide ingredients in claim 84 is greater than the molecular weight of ZrO_2.

The patent claim coverage provided by amended claim 84 is significantly better than the new claim 87 and amended claim 85 because the amended claim 84 covers examples 10 to 15 and 17 to 22 of Table I on pages 23 and 24 of applicants' originally filed specification.

Accordingly favorable allowance of amended independent claim 84 is respectfully solicited.

III. RECONSIDERATION OF THE OBVIOUSNESS REJECTIONS

A. Claims Rejected on the basis of Anderson alone

Claims 38, 40 to 47, 81 and 84 were rejected under 35 U.S.C. 103 (a) over U.S. Patent 6,800,574 issued to Anderson.

Reconsideration of the obviousness rejection based on the disclosures in the Anderson US Patent is respectfully requested for the following reasons.

A case of *prima facie* obviousness of a claimed composition should **not** be

based on disclosures of prior art compositions that contain the same ingredients with amount ranges that overlap or touch those of the claimed composition when the claimed composition is a narrow species of the broadly disclosed prior art compositions *under certain special circumstances described in further detail herein below*. If an obviousness rejection was always valid when the concentration ranges overlapped or touched, then e.g. any specifically claimed borosilicate glass with narrow amount ranges for e.g. TiO_2, ZrO_2 or other amount ranges would be obvious from the general concept of a borosilicate glass.

It is respectfully submitted that the narrowly claimed species according to claim 38 and applicants' other independent claims are not *prima facie* obvious from the broad generic disclosures of Anderson for the aforesaid reason.

The applicants' claimed compositions of claim 38 are narrow species in comparison to the broadly claimed generic composition of claim 1 and column 3, lines 49 to 61. of Anderson, which **comprises** (note the transitional wording is **not** "consists of" as alleged on page 3 of the Office Action):

(a) greater than 80 wt. % of SiO_2;

(b) an active rare earth dopant (the rare earth s; and

(c) a modifying dopant.

Thus even though a comparatively small number of embodiments out of all embodiments defined by the above prescription of Anderson contain SiO_2 amounts that fall within the upper part of the range according to claim 38, the total number of those embodiments with overlapping SiO_2 amounts is very large

in comparison to the number of embodiments covered by applicants' claim 38. The reason for that is that claim 38 is limited to a single rare earth oxide, Yb_2O_3, whereas the rare earth dopants of Anderson can be any rare earth compound of 13 metallic elements with atomic numbers from 58 to 70 (column 5, lines 29 to 34). Although oxides are mentioned specifically at column 5, line 35, some embodiments of the glass beads of US '574 contain substantial amounts from 20 mol % of an anion that is not an oxide anion. These non-oxide compounds can include fluorides, sulfides, selinides, any halide, chacogenides and arsenides (column 5, lines 17 to 23, of US '574). In addition to almost any rare earth oxide, halide, arsenide, selenide, sulfide or the like, the glass bead compositions of Anderson can contain alkali metal compounds, alkaline earth metal compounds, transition metal compounds and actinides as well as zirconium, aluminum, zinc, and titanium compounds (column 5, lines 10 to 15). The modifying dopants can include almost any compound of non-fluorescent rare earths, transition metals, gallium, indium, tin, boron, lead, phosphorus, arsenic, antimony, bismuth, germanium, and nitrogen (column 5, lines 48 to 63).

Thus the disclosure of the prior art patent of Anderson described in the first paragraph on page 3 of the Office Action and summarized herein above as comprising ingredients (a) to (c) encompasses several million possible combinations of compounds (e.g. @15 x 9 x @30 x 9 x 20 x 9 -- assuming only about 9 possible anions and that the composition of claim 1 of US '574 includes on auxiliary ingredient such as an alkali metal compound due to the process for its production), although the composition of Anderson must contain greater than

80 wt. % of SiO_2 and at least one rare earth compound. In fact, the composition comprising ingredients (a) to (c) above appears to be at least as broad as a glass composition containing SiO_2 and boron oxide, i.e. as broad as the concept of a borosilicate glass! In contrast in claim 38 applicants are claiming a very narrow species of a glass that must contain from 75 to 92 mol % of SiO_2 and Yb_2O_3 and optionally some ZrO_2. All other compounds are rigorously excluded from applicants' claimed glass.

Thus it is certainly true that applicants' are claiming a very narrow species in comparison to the very broadly disclosed composition of Anderson. The same is true of applicants' other rejected independent claims.

Furthermore the examples of Anderson lead one skilled in the art away from the narrowly claimed species e.g. of applicants' claim 38.

The examples in column 10 to column 16 of Anderson lead one skilled in the art away from a glass composition that necessarily contains from 75 to 92 mol % of silica and at least some Yb_2O_3. Examples 1 to 6 of US '574 contain almost 100 % silica and a few ppm of Erbium. Similarly examples 7 to 9 of US '574 include almost 100 % silica and up to 4500 ppm of erbium. Examples 10 to 14 contain up to about 94 mol % silica with a balance mostly of alumina and up to 380 ppm of erbium. Examples 15 to 20 are not examples of the invention of Anderson, which is described as generally containing more than 80 wt. % of silica. Thus Anderson teaches away from examples 15 to 20.

Also examples 19 to 24 of US '574 do **not** contain Yb_2O_3 or any other rare earth oxide as required by the claims of Anderson and the description of their

invention. Thus one cannot make arguments regarding the equivalence of the 13 rare earth oxides taught by Anderson with respect to these examples.

Thus the preferred compositions of Anderson, namely the examples in columns 10 to 16, would lead one skilled in the art away from the invention as claimed in applicants' independent claim 38, which excludes ingredients that are not recited in applicants' claims but included in the examples of Anderson, such as alumina, germanium, phosphorus and erbium oxide. Examples 1 to 14 of Anderson contain at least 94 mol % of SiO_2, a range which does not overlap the concentration range for silica in applicants' independent claims. Examples 19 to 24 do not include any rare earth oxide and thus one cannot argue that the other ingredient besides silica in these examples is equivalent to applicants' Yb_2O_3. Examples 15 to 20 of Anderson contain ingredients like Ge and P that are excluded from claim 38 by the "consisting of" wording and some of applicants' other independent claims. Also examples 15 to 20 are not examples of Anderson's claimed invention and hence presumably Anderson teaches away from these examples.

The above-described fact pattern regarding the relationship of the applicants' narrowly claimed glass compositions to the broadly claimed compositions of Anderson is exactly the fact pattern described in M.P.E.P. 2144.05 (second paragraph under "I. Ovelap of Ranges") and 2144.08 in regard to the judicial decisions in the *In re Baird* and *In re Jones* cases. A case of *prima facie* obviousness of applicants' claimed glass compositions is not established by

the broadly disclosed generic glass compositions of Anderson despite an overlapping concentration range for silica in e.g. claim 38 because the disclosed generic glass compositions of Anderson encompass several million more combinations of ingredients than applicants' narrowly claimed compositions and because the preferred examples of Anderson lead one skilled in the art away from the applicants' narrowly claimed invention.

The applicants' claimed glass compositions of e.g. claim 38 are very different from the examples of Anderson, because applicants include a combination of oxide ingredients that provides excellent X-ray absorption factors F_0. In contrast Anderson is unconcerned with X-ray absorption, because Anderson contemplates use of the glass composition in optical devices, such as laser devices, optical amplifiers and optical fibers. Many of these commercially marketed optical devices include erbium cations as active ingredient (column 8, lines 21 to 42, especially lines 23 to 24, and column 9, lines 27 to 30). Thus Anderson is most interested in glass compositions containing erbium and other rare earth cations in addition to silica, which can act as optical laser material or optical amplifiers. Anderson is not interested in selecting a combination of oxide ingredients for their silica-containing compositions, which optimize X-ray opacity.

For the aforesaid reason withdrawal of the rejection of claims 38, 40 to 47, 81 and 84 as obvious under 35 U.S.C.103 (a) over Anderson (US 6,800,574) is respectfully requested.

B. ANDERSON IN VIEW OF KUNERT

Claims 49, 50, 82 and 83 were rejected as obvious under 35 U.S.C. 103 (a) over the disclosures in US Patent 6,800,574, issued to Anderson, in view of US Patent 6,297,181, Kunert, et al.

Claim 49 covers a glass powder with a composition, which **consists of** 75 to 98 mol % of SiO_2, 0.1 to 25 mol % of Yb_2O_3, and 0 to 24.9 mol % of ZrO_2.

Kunert, et al, do disclose an X-ray opaque dental glass composition. Column 7, lines 9 to 13, of Kunert, et al, does disclose grinding and sieving their glass compositions to obtain a glass particulate with a mean particle size that is comparable to that recited in claim 49. The disclosure in column 7, lines 24 to 28, is also noted.

However the aforesaid features of claims 49 and 50 are not relied on to establish the patentability of the subject matter of claims 49 and 50. Instead the recited glass composition of claim 49 following "consisting of" is relied on to establish patentability. The same is true of claims 82 and 83, which rely on claim 81 and its narrowly defined glass composition.

Kunert, et al, discloses and claims glass compositions that necessarily include oxide ingredients that are excluded by the "consisting of" wording in claims 49 and 81. These oxide ingredients and their minimum amounts are as follows: Al_2O_3, 5 wt. %; Na_2O, 1 wt. %; and ZnO, 2 wt. %. All these ingredients are excluded by the wording of claims 49 and 81.

Thus Kunert, et al, cannot anticipate or be the basis for a case of *prima facie* obviousness of the amended independent claims 49 and 81 because their compositions for Al_2O_3, Na_2O and ZnO do not overlap.

Furthermore Kunert, et al, is only cited to supply the limitations regarding particle size and other features of the claimed glass powder that do not depend exactly directly on composition. Thus Kunert, et al, cannot provide one skilled in the art with the necessary motivation or suggestions to modify the disclosure of Anderson to arrive at the invention as claimed in claims 49, 50, 82 and 83.

For the foregoing reasons withdrawal of the rejection of claims 49, 50, 82 and 83 as obvious under 35 U.S.C. 103 (a) over the disclosures in US Patent 6,800,574, issued to Anderson, in view of US Patent 6,297,181, Kunert, et al, is respectfully requested.

IV. GRANTED GERMAN PATENT

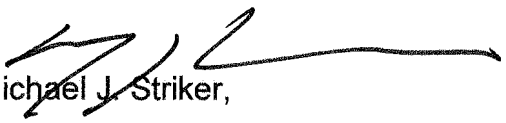
A German Patent was granted on the basis of the German Application, which is the priority document for the above-identified U.S. National Stage Application, on January 19, 2006.

Should the Examiner require or consider it advisable that the specification, claims and/or drawing be further amended or corrected in formal respects to put this case in condition for final allowance, then it is requested that such

amendments or corrections be carried out by Examiner's Amendment and the case passed to issue. Alternatively, should the Examiner feel that a personal discussion might be helpful in advancing the case to allowance, he or she is invited to telephone the undersigned at 1-631-549 4700.

In view of the foregoing, favorable allowance is respectfully solicited.

Respectfully submitted,



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